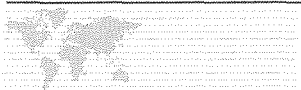


**ATTACHMENT 1  
THOMAS R. MARROU, P.E.,  
RESUME**

**Education**

M.E.E. Environmental  
Engineering, Rice  
University, Houston, Texas,  
1974

B.S. Environmental  
Engineering, Rice  
University, Houston, Texas,  
1974

**Certifications**

Professional Engineer –  
Texas #55058

LPST Project Manager –  
Texas #PM000223

**Golder Associates Inc. – Houston****Senior Environmental Services Manager**

Mr. Marrou is a Registered Professional Engineer with 39 years of consulting engineering experience. His main areas of focus are in process engineering, environmental engineering, waste management, design engineering and construction/remediation. His experience includes consulting expert and testimony in support of litigation concerning these practice areas. Mr. Marrou has served clientele in the federal, municipal and commercial/industrial sectors. Commercial/industrial clients have included chemical, petrochemical and refining corporations; oil & gas exploration and production clients, bulk terminal facilities, gas and liquid pipelines, electrical power generation and distribution, plastics, wood treating, and commercial treatment, storage, and disposal facilities. In addition to municipal clients such as airports, port authorities, and cities; Mr. Marrou has served federal clientele including DOD, EPA, USPS and other agencies.

Project work has ranged from process and engineering design of grass root facilities to debottlenecking projects, decontamination of facilities, demolition of existing infrastructure and Brownfield redevelopments. These have included manufacturing facilities, water treatment plants, wastewater treatment plants, management of solid and Hazardous wastes, and remediation of impacted media. He has prepared supervised, and/or successfully negotiated permits or compliance actions under the Clean Air Act (CAA), the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), the Toxic Substance Control Act (TSCA), and the Comprehensive Environmental Response Liability Act (CERCLA/Superfund).

**Employment History****Golder Associates Inc. – Houston, Texas**

Associate (2010 to Present)

**Brown and Caldwell – Houston, Texas**

Vice President (2000 to 2010)

**Roy F. Weston, Inc. – Houston, Texas**

Vice President (1987 to 2000)

**NUS Corporation – Houston, Texas**

Environmental Services Manager (1986 to 1987)

**CGM Engineering Corporation – Houston, Texas**

Vice President and Principal (1984 to 1986)



***Petromas, Inc. – Houston, Texas***  
*Engineering Manager (1978 to 1984)*

***S&B Engineers and Constructors, Inc. – Houston, Texas***  
*Process Engineer (1973 to 1978)*

## **PROJECT EXPERIENCE – ENVIRONMENTAL COMPLIANCE**

**Confidential Client**  
Texas

Project Director, Technical Consultant, Engineer of Record. Golder conducted site inspections and Naturally Occurring Radioactive Material (NORM) surveys on an expedited basis for approximately 400 Barnett Shale gas/condensate production facilities located within seven counties in Texas. Managed the completion of Spill Prevention, Control, and Countermeasure (SPCC) Plans for each production facility in accordance with state and federal regulations. Each plan evaluated various spill scenarios within each facility, outlined the steps to take in an emergency situation, and included containment calculations for all bulk storage tanks above 55 gallons. Field work was completed in three weeks, and the project in its entirety was completed in two months to meet a tight regulatory deadline.

**Confidential Chemical  
Company – Impound  
Closure**  
Texas, US

Project Director. Managed the regulatory evaluation of closure options for both RCRA and non-RCRA regulated impoundments at a Texas Gulf Coast chemical plant. Completed economic analysis, regulatory analysis, and closure plan revisions.

**Multiple Facilities**  
Multiple States, US

Project Director, Project Manager, Technical Consultant. Mr. Marrou has either personally audited or managed environmental audits at facilities at a number of facilities throughout the US for various manufacturing operations including chemical plants, refineries, oil & gas facilities, terminals, deep well injection facilities, and other types of operations.

## **PROJECT EXPERIENCE – ENVIRONMENTAL MANAGEMENT**

**Confidential Electrical  
Utility Company**  
Texas, US

Environmental Management Benchmarking Evaluation  
Project Director. Evaluated the status of the organization, staffing, and employee acceptance of the environmental program at an electrical utility department. Interviews were held with a cross-section of the staff, a management seminar was held to develop an Environmental Mission Statement for the EUD, and a benchmarking report was prepared.

**Stan Trans**  
Nationwide, US

Project Director. Managed all environmental programs for a major bulk liquid chemical terminal including air programs, regulatory interface for on-site wastewater treating, Coast Guard permitting and hazardous waste activities.



## **PROJECT EXPERIENCE – AUDITING**

**Confidential Client –  
Audit Program**  
Houston, Texas, US

Project Director. Developed an audit program for a natural gas processing company that included checklists, protocols and a data base structure. Thirty-two gas processing plants and associated facilities were audited for environmental liability and compliance with regulations such as SPCC, SWPPP, Air Permits, and other programs. The results were input into the audit data base for management priority and to ease monitoring of follow up items.

**Multiple Clients –  
Facility Audits**  
Various Locations, US

Project Director. Multiple facility audits in the manufacturing, refining, chemical processing, construction, gas processing, liquid pipeline, and other fields. Audits include Phase I, II, and III liability assessments for environmental compliance and waste disposal facilities.

## **PROJECT EXPERIENCE – PERMITTING**

**Confidential Clients**  
Multiple States, US

Project Director, Project Manager. Mr. Marrou has assisted in or managed the application or renewal of Part B permits under RCRA for two petroleum refineries, a commercial TSD, and several smaller facilities.

**Domco Manufacturing  
– Air Permit  
Application**  
Houston, Texas, US

Project Director. Domco Manufacturing produces floor tiles at a Houston, Texas facility. Mr. Marrou acted as Project Director and Project Manager to prepare a construction permit application on a fast-track basis for proposed facilities and to permit grandfathered sources. The permit was granted by the Texas Commission on Environmental Quality (TCEQ) less than four months after work initiated on the application.

**Confidential Chemical  
Company – New  
Facility Permitting**  
Texas, US

Project Director. A grass roots chemical plant is to be constructed on the Texas Gulf Coast. Permit applications were prepared for the air and wastewater media. Design was modified to allow hazardous waste management under future operations.

**Confidential Client –  
Construction Permit  
Application and Other  
Environmental Support**  
Texas, US

Project Director. Investigated all sources of normal and maintenance generated sludges requiring treatment. Developed process design including heat and material balance, process flow, piping and instrument diagrams and equipment specifications for sludge receiving, storage oil removal and filtration using plate and frame technology, calculations, application package, and representation at public meetings to obtain a Texas New Source Review (NSR) construction permit for a proprietary specialty chemical on a fast track basis.

**Confidential Client –  
Construction Permit  
Application and  
Closure Certification**  
Texas, US

Project Manager. Reviewed equipment, flow sheets and batch cycles for existing organic peroxide unit. Prepared material balance and air emission calculations for registration of “grandfathered” unit. Reviewed and approved facility closure plans for hazardous waste storage and treating facilities; closure certification; consulting on preparation of emergency procedures manual.



<b>Confidential Client – Construction Permit Application</b> Texas, US	Project Manager. Prepared Texas Natural Resource Conservation Commission (TNRCC) air program construction permit applications including flow diagrams, emission calculations and all other relevant information for herbicide and fungicide formulation unit, amendments to existing manufacturing units and registration of a “grandfathered” herbicide plant. Prepared solid/hazardous waste flow diagrams for planned waste management activities. Reviewed plant hazardous waste management procedures.
<b>Confidential Client – Permitting Assistance</b> Houston, Texas, US	Process Engineer. Existing plant could not meet existing permit conditions. Developed sampling and analysis plan and developed process for carbon treatment system. Flow sheets were completed, equipment specified, and all units sized for custom carbon treatment.
<b>Confidential Client</b> Texas, US	Project Director. The project involved the preparation of a permit application for a Texas petroleum chemical manufacturing facility expansion. Project activities included preparation of confidential and non-confidential process descriptions, complete regulatory review, characterization of emissions, and all appropriate Texas Air Control Board application forms.
<b>ELF Atochem North America</b> Texas, US	Project Director. The project involved the preparation of a permit application for an organic chemical manufacturing facility located in Texas. The application included a thorough description of the existing facility and its emissions.
<b>Confidential Client – Permit Negotiations</b> Arkansas, US	Project Director. Successfully negotiated closure and post closure care issues for a Part B permit serving a refinery land treatment facility and a hazardous waste surface impoundment. Work included the process and detailed design of an oily waste treatment facility for Resource Conservation and Recovery Act (RCRA) hazardous waste. Successfully negotiated an alternate cap design for the impoundment estimated to save the client over \$1 million.

## PROJECT EXPERIENCE – ENVIRONMENTAL ASSESSMENT

<b>Confidential Client – Site/Compliance Environmental Assessment</b> Various Locations, US	Project Director. Environmental assessment for both site liability and compliance for a gas pipeline operating company. Work included preparation of questionnaires, protocol and data base structure for information management. Program setup and sixty-four sites audited as pilot for several thousand company-owned facilities. Client staff trained to assume responsibility for long term system management
<b>Public Utilities Board – Site Investigation</b> Brownsville, Texas, US	Project Director. The project involved an investigation of an aboveground fuel oil storage tank to determine if the leaking tank had impacted surrounding soils or groundwater. Push technology was used to complete a series of soil and groundwater samples. The results indicated no impact. The entire project was completed in less than 1 month and only 2 field days were required. The fast-track schedule was necessary since the tank was in a short turnaround and maintenance period so that PUB personnel were not hampered from their tasks.

**Cytec Industries – Site Investigation**  
Fort Worth, Texas, US

Project Director. Prepared a work plan, completed field investigations, and prepared a report for submittal to the TCEQ. The site of a prior catalyst manufacturing plant was the subject of agency scrutiny. A scope of work was prepared in response to TNRCC's request for a comprehensive investigation of the site. Project activities included preparation of the work plan; completion of borings; installation of groundwater monitoring wells; and sampling of surface water, surficial soil, and river sediment to determine if impacts have occurred due to site activities and to determine closure options under various regulatory programs.

**Confidential Client – Facility Investigation**  
Arkansas, US

Project Director. Conducted a facility investigation of a wood treating plant with over thirty solid waste management units (SWMUs). Work also included application for a Resource Conservation and Recovery Act (RCRA) Part B permit and evaluations of wastewater and stormwater treatment. Project has gone from site investigation through corrective measures study and design of remediation. Remedial measures include groundwater recovery systems, slurry walls, soil consolidation and capping, and surface water control. Work performed under a consent decree with a state agency under a strict schedule for action. Successfully negotiated corrective action at a fraction of the cost of agency preferred options.

**Confidential Client – Facility Investigation**  
Deer Park, Texas, US

Project Director. Conducted a facility investigation and corrective measures study for a chemical manufacturer. Constituents of concern included chlorinated solvents, other organics and metals. Investigation included both soils and groundwater in four units to a depth exceeding 100 feet below grade. Work has included a corrective measures study and slurry wall design and construction oversight.

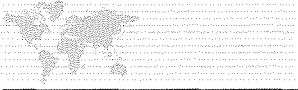
## PROJECT EXPERIENCE – CONTAMINATED LAND REMEDIATION

**El Paso Corporation**  
US

Mr. Marrou has served in both a contract management and technical role for assisting El Paso Corporation with their Remediation Program nationwide. The work has been completed and is ongoing at over 50 sites in 18 states. The work initiated in 2004 and is ongoing under a life cycle cost based environmental management system. Assignments have included investigation of impacted sites, remedial design, remediation, long term monitoring, operations and closure.

**Confidential Client – Pipe Terminal Site Remediation**  
Texas, US

Project Director. Completed three remediation projects for an oil field service company. Two locations completed Risk Reduction Standard Number 2 closures under TNRCC (1998). The third facility similarly closed under RRS #2 but was managed through the Voluntary Cleanup Program and also included an Innocent Owner/Operator Program application due to impact from an off-site source (1999/2000).

**Confidential Chemical  
Corporation**  
US

Mr. Marrou has served in both a contract management and technical role for assisting a Fortune 100 Corporation with their Remediation Program nationwide. The work is ongoing or assignments completed at eight chemical manufacturing facilities and an integrated oil refinery. The program manages ongoing assignments against like cycle costs at each site and is driven by innovation that leads to cost efficiencies that reduce cost to recover a portion of the life cycle cost established for the site. Assignments have included due diligence, decontamination, demolition planning, investigation of impacted media, permitting, remedial design, remediation, long term monitoring, operations and closure. Work is under multiple state programs, RCRA, and negotiated consent documents.

**Confidential Client –  
Pipe Terminal Site  
Remediation**  
Texas, US

Project Director. Completed three remediation projects for an oil field service company. Two locations completed Risk Reduction Standard Number 2 closures under TNRCC (1998). The third facility similarly closed under RRS #2 but was managed through the Voluntary Cleanup Program and also included an Innocent Owner/Operator Program application due to impact from an off-site source (1999/2000).

**City Public Service**  
San Antonio, Texas, US

Polychlorinated Biphenyl (PCB) Remediation  
Project Director. The project involved the planning and remediation oversight for four areas that were contaminated by historical spills. All work was completed in accordance with Risk Reduction Rules and the Toxic Substance Control Act (TSCA). Provided technical review on all project documents. Negotiated a favorable waste classification that saved the client approximately \$1 million. Utilized an on-site laboratory to save the client money and shorten the project schedule.

**City of Austin Electric  
Utility Department –  
Asbestos and Lead  
Remediation**  
Austin, Texas, US

Project Director. Provided project management for the assessment, specification, and abatement oversight of asbestos abatement at the Seaholm Power Plant. The work included waste management of lead-based paint and asbestos containing materials (ACMs). Work was completed on schedule and under budget.

**City of Austin Electric  
Utility Department**  
Austin, Texas, US

Project Manager. Work has included on-site analytical capability for PCB and asbestos analysis, air monitoring for personnel, and perimeter/work place conditions and removal of contaminated soils, capacitors, asbestos, and contaminated debris at the Seaholm Power Plant. Also conducted on-site water treatment for decontamination, stormwater and groundwater. Successfully negotiated in place options for underground storage tanks and on-site disposal that saved the client significant cost.

**Multiple Clients –  
Superfund Sites in  
EPA Region VI**  
Various Sites, US

Project Director. Clientele included potential responsible parties (PRPs) and agencies. Consultation to the project team at over six sites including chemical processing, metals recovery, wood treating, refining and disposal sites. Remediation includes consolidation, capping, groundwater recovery and treatment, incineration, solvent extraction and other technologies.

**Multiple Clients**  
Various Locations, US

Investigation, Removal, and/or Remediation of Aboveground and Underground Storage Tank Facilities  
Project Director. Projects for multiple sites and locations including petroleum fuels, hazardous waste, wood treating chemicals, and miscellaneous chemicals. Multiple industries, tanks, and states were involved.

**Confidential Client –  
Soil Remediation  
Program**  
Various Locations, US

Project Director. Work occurred at several compressor stations along a natural gas pipeline and included project work plans, health and safety, soil excavation and off-site disposal, on-site PCB analysis, equipment decommissioning, asbestos removal, and site restoration.

**Confidential Client**  
Carlyss, Louisiana, US

Recovery of Free Phase Chlorinated Organic Solvents from Surface Impoundments  
Project Consultant. Work included work plan preparation, design of recovery system, and recovery of over one million gallons of solvent for recycle. Project included air monitoring, health and safety, and agency interface tasks.

---

**PROJECT EXPERIENCE – DUE DILIGENCE****Multiple Clients**  
US

Mr. Marrou has served as Client Service Manager, Project Manager and/or technical lead for due diligence projects for both acquisition and divestiture throughout the United States. Facilities have included oil and gas exploration and production, gas and liquids transmission pipelines and processing, oil field service, chemical manufacturing, equipment manufacturing, waste management as well as other facilities. Projects have ranged from single sites to corporations with over 100 sites in multiple states.

**Confidential Client**  
Texas, US

Project Director. Calculated emissions from above-ground crude oil storage tanks as part of a Real Estate Environmental Compliance Audit for a crude oil pipeline.

**Confidential Oil Field  
Service Client**  
US

Project Director. Assisted a major oil field service company in due diligence activities and limited environmental audits to acquire over 100 new sites in six states. ASTM compliant Phase I Environmental Site Assessments (ESAs) were completed at all sites in three weeks using multiple teams from multiple offices. Phase II ESAs were completed at a few sites over a holiday weekend to meet the aggressive schedule. Mr. Marrou assisted in established a range of potential environmental liabilities and in negotiations with the selling company to establish a reasonable environmental reserve. The acquisition was completed and work continues to meet requirements using the established cost basis.

**Confidential Chemical  
Company**  
US

Project Director and Technical Consultant. Assisted a chemical manufacturing company in completing pre divestiture due diligence and limited environmental audits at seven locations in three states. ASTM compliant Phase I's were completed at all sites and Phase II investigations completed at three sites. Compliance issues were resolved with existing site personnel during phase I's and follow up activities.





## **PROJECT EXPERIENCE – EXPERT WITNESS**

**Multiple Clients –  
Litigation Support**  
Texas and Louisiana,  
US

Project Director. Assisted clientele in litigation and served as a testifying expert on multiple assignments. Recent work has included leaking underground storage tanks, off-site impacts from environmental releases, environmental remediation, waste characterization, site assessment methodology, facility operations and waste disposal practices.

**Multiple Clients**  
Texas, US

Project Director. Provided professional opinions and expert testimony in the areas of Resource Conservation and Recovery Act (RCRA) permitting, underground storage tank (UST) investigation/remediation, contaminated soils/groundwater management, and facility design.

## **PROJECT EXPERIENCE – INFRASTRUCTURE**

**Confidential Client**  
Texas and Louisiana,  
US

Process Engineer. Polypropylene reaction, drying, and solvent recovery; wastewater neutralization and screening, boiler conversion to gas and/or fuel oil firing and plastics pneumatic conveying.

## **PROJECT EXPERIENCE – WATER TREATMENT**

**Confidential Client –  
Startup Activities for  
Wastewater Treatment  
System**  
Texas, US

Process Engineer. Performed field startup activities for a 1 million-gallon-per-day (mgd) wastewater treatment system that includes sanitary pretreatment, chlorination, sedimentation neutralization, carbon pretreatment, extended aeration and clarification. Recommended revisions were designed and were implemented.

**Confidential Client**  
Crosby, Texas, US

Process Engineer/Project Manager. Investigated sources of water, stream characterization, minimization of generated waste, developed design basis, heat and material balances, equipment specifications, piping and instrument diagrams and detailed design drawings. Unit treats contaminated stormwater and process wastewater in anaerobic pretreatment, neutralization, activated sludge, clarification, filtration and post carbon adsorption systems.

**Confidential Client –  
Wastewater /  
Stormwater  
Investigation**  
Various Locations, US

Project Manager. Investigation of all sources of wastewater/stormwater at a major facility facing new Publicly Owned Treatment Works (POTW) pretreatment standards. Wastewater characterized by existing and new data with evaluation of treatment options capable of meeting required discharge levels. Estimate prepared for compliance cost including option of direct discharge through a National Pollutant Discharge Elimination System (NPDES) outfall.

**Agricultural Chemical  
Plant – Wastewater  
Survey**  
Texas, US

Project Director. Performed a unit-by-unit survey to confirm sources of wastewater within each portion of plant. Examined waste minimization options and pretreatment options to allow for central treating plant. Constituents included arsenic, solvents, herbicides and general metal and organic contamination. Options included replacement of surface impoundments and ground equipment with new aboveground facilities.



**Confidential Client –  
Development of  
Sampling and Analysis  
Plan**  
Baton Rouge, Louisiana,  
US

Process Engineer. Reviewed data, developed design basis for stormwater treatment system for neutralization and fines/pellet removal. System designed utilized spent acid stream to neutralize wastewater in new facility and screening of ~30 million-gallons-per-day (mgd) stormwater flow.

**City of Austin Electric  
Utility Department**  
Austin, Texas, US

Wastewater Discharge Permit Renewal  
Project Director. Prepared permit renewal applications for the Holly and Decker Power Plants in Austin, Texas. U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) and TNRCC permit applications were necessary at both locations. As a part of the renewal, stormwater was incorporated into both permits and the issue of an ongoing Toxicity Reduction Evaluation (TRE) was addressed. Additionally, a compliance audit of the wastewater management system was performed.

**Public Utilities Board –  
Wastewater Discharge  
Permit Renewal**  
Brownsville, Texas, US

Project Director. Provided technical direction and management of a NPDES permit renewal that involved both Texas Natural Resource Conservation Commission (TNRCC) and the U.S. Environmental Protection Agency (EPA)-Region VI regulations. The facility was a gas-fired power plant.

**Confidential Client –  
Wastewater Treatment  
Plant Evaluation**  
Texas, US

Project Director. Evaluated a wastewater treatment plant, including a unit by unit waste evaluation, at a petroleum refinery. Existing operations included oil/water separation, equalization, aerobic biological treatment and clarification. Studies included process stormwater segregation, biotoxicity testing, and the effect on treatment capacity and efficiency.

**Confidential Client –  
Wastewater Discharge  
Permitting**  
Texas, US

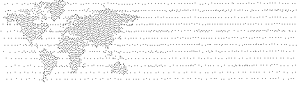
Project Director/Agency Negotiator. Negotiated the renewal of an U.S. Environmental Protection Agency [National Pollutant Discharge Elimination System (NPDES)] and Texas Natural Resource Conservation Commission (TNRCC) wastewater discharge permits. Negotiations were specifically associated with Toxicity Reduction Evaluation/Toxicity Identification Evaluation permit language and protocols due to known toxicity problems in the agricultural chemical outfall.

**Mineral Research and  
Development  
Corporation**  
Freeport, Texas, US

Wastewater and Stormwater Discharge Toxicity Compliance  
Project Director. Completed this project for and inorganic chemical company to negotiate and comply with a TNRCC board order to correct wastewater and stormwater discharge toxicity. Process operations were reviewed and wastewater, stormwater, and soils were sampled to determine the source of toxicity and to decide if operations could be revised to eliminate the toxicity. Negotiated on behalf of the client with the TNRCC and recommended facility modifications and wastewater treatment to control the effluent toxicity. Provided engineering services, and the facility implemented the cost effective controls using plant personnel.

**Confidential Client –  
Pilot Plant Operation**  
Texas, US

Process Engineer. Assisted in field studies and operation of a pilot plant to simulate wastewater treatment by cold lime softening. Designed and completed sludge alternative treating testing and assisted in preparation of flow sheets piping and instrument diagrams and equipment specifications.



**Multiple Clients –  
Wastewater  
Investigation**  
Various Locations, US

Process Engineer. Investigation of sources of wastewater, potential minimization, compatibility characterization and treatment efficiency for four facilities. Recommended process and operational changes at one facility and new treatment systems for three facilities.

**Star Enterprise –  
Wastewater Survey**  
Texas, US

Project Director. Performed a unit-by-unit survey of wastewater generated at an integrated oil refinery. Options considered included waste minimization, at source treatment, and end of pipe treatment. Waste characterization included stream compatibility. Redesign included analysis of equalization volume to replace impoundments with tankage and pilot studies to confirm toxic effects of wastewater.

## **PROJECT EXPERIENCE – AIR QUALITY**

**Agricultural Chemical  
Plant – Air Emission  
Control System**  
Texas, US

Project Director. Process design, equipment specification and project cost estimate for toxic gas collection and absorption/destruction system. Size absorption columns, review operation, materials of construction and a control of acid recovery system including toxic gas destruction by chemical reaction and catalytic incineration.

**Multiple Clients – Air  
Compliance  
Assistance**  
Houston, Texas, US

Project Director. Prepared an amendment to the Texas Natural Resource Conservation Commission (TNRCC) air operating permit for an organic chemical manufacturing unit. Assisted in regulatory negotiations and an amicable settlement of a Notice of Violation.

**Confidential Client –  
Air Permitting**  
Louisiana, US

Project Director. The project involved the preparation of an air permit application for a custom ball valve manufacturing facility. Air emissions from the various manufacturing processes were calculated, and the applicable Louisiana regulations for this project were determined.

**Confidential Client –  
Air Permitting**  
Texas, US

Project Director. The project involved the preparation of a standard exemption for a soil remediation project that required thermal oxidation of volatile organic compound (VOC) emissions.

**Diamond Shamrock –  
Air Toxics Fugitive  
Source Investigation**  
Houston, Texas, US

Technical Manager. Investigated air toxics fugitive sources and designed a recovery and treatment system at an organic specialty chemical facility.

**Confidential Clients –  
Air Emissions  
Inventories**  
Multiple Locations, US

Project Director. The project involved an investigation of an aboveground fuel oil storage tank to determine if the leaking tank had impacted surrounding soils or groundwater. Push technology was used to complete a series of soil and groundwater samples. The results indicated no impact. The entire project was completed in less than 1 month and only 2 field days were required. The fast-track schedule was necessary since the tank was in a short turnaround and maintenance period so that PUB personnel were not hampered from their tasks.



## **PROJECT EXPERIENCE – ENVIRONMENTAL ENGINEERING**

**Multiple Clients –  
Design Services**  
Gulf Coast, US

Project Manager. Process design, equipment specification, and engineering design for numerous facilities including five manufacturing facilities, various debottlenecking and process improvement projects, and several infrastructure projects.

**Confidential Client –  
Multiple Projects**  
Pasadena, Texas; Joliet,  
IL; Lake Charles, LA, US

Process Engineer. Fertilizer manufacturer, phosphoric acid, ammonia and sulfuric acid handling systems, air emissions control, water treating systems, and soda ash pneumatic conveying.

**Confidential Client –  
General Engineering  
Services**  
Texas, US

Process Engineer. Field investigations, waste characterization, process development, detailed design, and construction for removal of copper from National Pollutant Discharge Elimination System (NPDES) permitted discharge.

**Confidential Client –  
Toxicity Reduction  
Evaluation**  
Texas, US

Project Director. Conducted a TRE and subsequent Toxicity Identification Evaluation (TIE) at a combined petrochemical manufacturing facility and petroleum refinery. Intermittent, acute, and chronic toxicity was traced to a particular class of compounds. Pilot studies are underway for at-source and end-of-pipe treatment options.

**Confidential Client –  
Asphalt Plant  
Engineering Design**  
Texas, US

Project Manager. The project involved the de-bottlenecking and expansion of an asphalt blowing still in Texas. Work including creation of engineering plans, specifications, bid documents, bid evaluation, and contractor selection recommendations. Facilities included raw material handling, blowing still, pumps, compressors, heat exchangers, tanks, vapor control, and instrumentation.

**Confidential Client –  
Facility Design**  
Deer Park, Texas, US

Project Manager. Design of a hazardous waste receiving, storage, separation, and deep-welling facility. Work included all aboveground facilities required under the Part B permit.

## **PROJECT EXPERIENCE – PROCESS ENGINEERING**

**Confidential Client –  
Process Study**  
Deer Park, Texas, US

Process Engineer. Investigated existing unit, developed process flow sheets, piping and instrument diagrams and heat and material balances. Became basis for computer model of brine treating for new units.



**Confidential Client –  
Sludge Management  
Facility**  
Arkansas, US

Process Design, Engineering Design, and Construction Bid Specifications  
Project Manager and Process Engineer for a sludge treatment facility to replace a hazardous waste landfarm unit at a refinery in EPA Region 6. Work included a review of pilot plant tests, developing process, sizing equipment, and preparing engineering plans and specifications. Equipment included sludge receiving and pumping, lime handling, lime treatment, dewatering using plate and frame filtration, and associated structures instrumentation and utilities. As part of the overall project, assisted in negotiation of a Closure and Post-Closure Care RCRA Permit for the sludge impoundment and landfarm to be closed. Assisted in solidification technology, biological treatment technology, and cap design. Helped to develop the online quality assurance sampling program to confirm process effectiveness for solidification and the final compliance testing protocol to meet agency requirements confirming closure.

**Confidential Client –  
Process Design Water  
and Sludge Treatment  
System**  
Torrance, California, US

Technical Manager. Development of process design, pilot studies, process flow diagrams, piping and instrument diagrams, equipment specifications, detailed design and construction management for a caustic water flood project. Produced water required deration, filtration, in exchange and chemical addition prior to reinjection. Wastewater from heater treaters/BS&W and ion exchange regeneration required neutralization oil removal sludge thickening and filtration by plate and frame technology.

**Superior Oil – Design  
Services**  
Torrance, California, US

Process Engineer/Engineering Manager. Oily sludge treating facility process design, equipment specification, and operations manual. Included waste reception facilities, oil recovery by plate and frame filtration, and dry cake handling.

## PROJECT EXPERIENCE – WASTE

**Multiple Clients –  
Compliance  
Assistance**  
Various Locations, US

Process Engineer. Calculated emissions, specified control devices, completed permit applications, and assisted in agency negotiations for multiple facilities including specialty organic chemicals, bulk liquid terminals, plastic manufacturing, agricultural chemicals and commercial hazardous waste treating operations.

**Public Utilities Board –  
Solid Waste  
Classification**  
Brownsville, Texas, US

Project Director. Provided technical direction, management, and field inspection services for the classification of solid waste streams that were generated by the utility. Facilities included water treatment plants, wastewater conveyance and treatment facilities, a power generation plant, electrical substations, vehicle maintenance facilities, and general maintenance facilities.

**Confidential Client –  
RCRA Part B Permit  
Preparation**  
Houston, Texas, US

Project Director. Prepared a RCRA Part B permit for a commercial hazardous waste storage, blending, and treatment facility. Assisted in negotiation for permit issuance including air emission issues.



---

## Resumé

---

THOMAS MARROU, PE

---

**Confidential Client –  
Part B Permit  
Application and  
Negotiation**

Houston, Texas, US

Project Director. Prepared application and successfully negotiated for the air emission portion of a Part B permit for a commercial waste blending operation.

**Hunt Refinery – RCRA  
Part B Facility Permit**  
Alabama, US

Resource Conservation and Recovery Act (RCRA) Part B Facility Permit for a Hazardous Waste Land Farming Operation  
Project Manager/Permit Negotiator. Dual permits were issued for U.S. Environmental Protection Agency (EPA) Region IV and Alabama Department of Environmental Management. Managed the implementation of permit conditions including the land treatment demonstration, the continuing release investigation and closure of two existing hazardous waste landfarms.

**Confidential Client –  
Part B Permit  
Application**

Gulf Coast, Texas, US

Engineering Manager. Prepared a Part B permit application for a hazardous waste treatment facility. Work included permit application and design of the permitted facility.

## PROFESSIONAL AFFILIATIONS

National Society of Professional Engineers, Member

Texas Society of Professional Engineers, Member

Water Environmental Federation, Member

Air and Waste Management Association